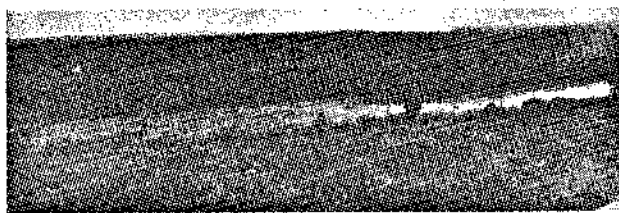


use of SPRINKLER SYSTEMS for WASTE

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One of 4 lagoons used for storage and one of 3 circular center-pivot sprinkler systems used to dispose of waste water from a 15,000-head hog farm near Ordinance, Oregon.



A big gun sprinkler discharging manure on a dairy farm pasture north of Seattle, Washington.

by Claude H. Pair²

Increasing human population, together with increased production of food, fiber and manufactured products have created wastes that exceed the diluting capacity of natural streams, rivers, lakes and other waters. This has resulted in extensive water pollution in many areas.

Recent federal and state laws require a reduction in air and water pollution and compel those responsible to devise ways and means of treating their waste waters to reduce pollution. Sprinkler irrigation systems are being used in the renovation and use of waste waters generated by farms, cities, industrial and food processing plants in the northwestern United States. These waste waters were formerly discharged directly into the nearest stream, lake, well or waterway.

One method of renovation is to spread the waste waters over the soil where natural processes such as the filtering action of the soil particles, biological action in the soil and the uptake of chemical nutrients by plants break down the pollutants and cleanse the water for further use. Sewage effluent has been used for irrigation for

over 100 years in some parts of the world (4). A 1964 survey (7) reported 1300 waste water treatment plants used soil systems in the treatment process. About one-third of these systems use the water discharged for irrigating agricultural crops. Glass and Jenkins (1964) (2) reported 361 municipal waste treatment plants in the 17 western states applied their discharge water to the land in 1962. Of this number, 39 systems were in the states of Idaho, Montana, Oregon, Washington and Wyoming.

The suitability of water for irrigation is determined by the benefits and problems caused to the crops and soils to which it is applied. Some waste waters contain salts that reduce their value or prohibit their use for agriculture. For example, exchangeable sodium and heavy metals can accumulate in the soil and adversely affect some crops. Sodium causes soil particle dispersion and sealing of soils. Some waters contain toxic quantities of boron, chloride and molybdenum. Industrial waste waters may contain zinc, copper or lead in injurious quantities. Concentrations of 100 ppm of copper and 300 ppm of zinc are toxic on land for plant growth. Some ions, while present in small amounts, could accumulate in the soil over a period of time and cause problems.

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Sprinklers being used in an experiment designed to dispose of effluent from a paper plant. The location is near Wallula, Washington.



A 120-acre solid set sprinkler system being used to dispose of sewage effluent from a community of 7200 people near Redmond, Washington.